## **AMENDMENT**

The following listing of claims replaces all prior listings of claims in this application.

Claims 1-23 (Canceled)

24. (Original) A device for separating molecules, the device comprising:

a plurality of alternating constricted and unconstricted regions forming a channel;
the unconstricted regions having a transverse dimension and length sufficient to allow a
larger molecule to approach its equilibrium shape as it moves through the channel in response to a
driving force; and,

the constricted regions having a transverse dimension sufficiently small to influence the shape of some of the molecules moving through the channels.

- 25. (Original) The device of claim 24 wherein the constricted regions provide a trapping point adjacent an unconstricted region, and wherein the larger molecules have a wider contact area at the trapping point of the constricted regions, and thus have a higher probability of escaping the unconstricted region through a constricted region than a smaller molecule.
- 26. (Original) The device of claim 24 wherein molecules in the unconstricted regions are in a relaxed state, and are entropically hindered from entering adjacent constricted regions in the channel.
- 27. (Original) The device of claim 24 and further comprising a substrate supporting the channel.
- 28. (Original) The device of claim 24 wherein the constricted regions are nonofluidic, and the unconstricted regions are obstacle free.
- 29. (Original) The device of claim 24 wherein the equilibrium spherical shape of a smaller molecule has a radius of gyration, and wherein the constricted region has a transverse dimension less than such radius of gyration.
- 30. (Original) The device of claim 24 wherein both large and small molecule need to deform from their equilibrium states to enter the constricted region.
- 31. (Original) The device of claim 24 wherein the equilibrium shape of the larger molecule is influenced by the constricted region to a greater extent than the equilibrium shape of a smaller molecule.
- (Original) A device for separating molecules, the device comprising:a plurality of alternating constricted and unconstricted regions forming a channel;

the unconstricted regions having a depth and length sufficient to allow a larger molecule to approach its radius of gyration as it moves through the channel in response to a driving force;

the constricted regions having a depth less than a radius of gyration of a smaller molcule; and means for applying force to molecules in the channel.

- 33. (Original) The device of claim 32 wherein the constricted regions provide a trapping point adjacent an unconstricted region, and wherein the larger molecules have a wider contact area at the trapping point of the constricted regions, and thus have a higher probability of escaping the unconstricted region through a constricted region than a smaller molecule.
- 34. (Original) The device of claim 32 wherein molecules in the unconstricted regions are in a relaxed state, and are entropically hindered from entering adjacent constricted regions in the channel.
- 35. (Original) The device of claim 32 and further comprising a substrate supporting the channel.
- 36. (Original) The device of claim 32 wherein the constricted regions are nonofluidic, and the unconstricted regions are obstacle free.
- 37. (Original) The device of claim 32 wherein the equilibrium spherical shape of a smaller molecule has a radius of gyration, and wherein the constricted region has a transverse dimension less than such radius of gyration.
- 38. (Original) The device of claim 32 wherein both the larger and smaller molecule need to deform from their equilibrium states to enter the constricted region.
- 39. (Original) A device for separating molecules, the device comprising: an input reservoir and an output reservoir;

a plurality of alternating constricted and unconstricted regions forming a channel coupled between the input and output reservoir;

the unconstricted regions having a depth and length sufficient to allow a larger molecule to approach its equilibrium spherical shape as it moves through the channel in response to a driving force; and,

the constricted regions having a depth less than an equilibrium spherical shape of a smaller molecule.

40. (Original) The device of claim 39, wherein the input and output reservoirs are positioned to contain a buffer solution with molecules to be separated.

- 41. (Original) The device of claim 40 and further comprising a first contact positioned within the input reservoir to contact the buffer solution and a second contact positioned within the output reservoir to contact the buffer solution.
- 42. (Original) The device of claim 39 and further comprising a detector positioned about the channel to detect desired molecules in the channel.
- 43. (Original) The device of claim 42 wherein the detector comprises an optical microscope.
- 44. (Original) A device for separating molecules, the device comprising:
  - a loading chamber;
- a plurality of separation channels coupled to the loading chamber, each separation channel having a plurality of alternating constricted and unconstricted regions;

the unconstricted regions having a depth and length sufficient to allow a larger molecule to approach its equilibrium spherical shape as it moves through the separation channel in response to a driving force; and,

the constricted regions having a depth less than an equilibrium spherical shape of a smaller molecule.

- 45. (Original) The device of claim 44 wherein different separation channels have different structural parameters selected from the group consisting of a transverse dimension and length of each of the regions.
- 46. (Original) The device of claim 45 wherein the parameters are optimized for the separation of different length ranges of molecules.
- 47. (Original) The device of claim 44 wherein the loading chamber comprises multiple support pillars.
- 48. (Original) The device of claim 44 wherein the loading chamber is coupled to a loading channel by an entropic barrier.
- 49. (Original) The device of claim 44 wherein the loading chamber is coupled to a first electrical contact through an entropic barrier.
- 50. (Original) The device of claim 49 wherein the separation channels are coupled to a second electrical contact, and wherein the first and second electrical contacts provide an electric field for driving molecules through the separation channels when coupled to a power source.
- 51. (Original) A device for separating larger molecules from smaller molecules, the device comprising:

a channel having a depth and length sufficient to allow larger molecules to approach their equilibrium spherical shape; and

means for creating a series of entropic barriers to selected molecules in the channel.

- 52. (Original) The device of claim 51 and further comprising means for driving the molecules through the channel.
- 53. (Original) A device for separating molecules, the device comprising: a sequence of an unconstricted region and an entropic barrier forming a channel;

the unconstricted region having a transverse dimension and length sufficient to allow selected molecules to approach their equilibrium shape as they move through the channel in response to a driving force; and,

the entropic barrier influencing the shape of selected molecules as they move through the channel.

- 54. (Original) The device of claim 53 wherein the entropic barrier provides a differential delay of molecules moving through the channel based on the size of the molecules.
- 55. (Original) The device of claim 53 and further comprising further alternating unconstricted regions and entropic barriers forming the channel.
- 56. (Canceled)